

Soft corals (Coelenterata: Octocorallia: Alcyonacea) from the Laccadives (SW India), with a re-examination of *Sinularia gravis* Tixier-Durivault, 1970

J. Vennam & L.P. van Ofwegen

Vennam, J. & L.P. van Ofwegen. Soft corals (Coelenterata: Octocorallia: Alcyonacea) from the Laccadives (SW India), with a re-examination of *Sinularia gravis* Tixier-Durivault, 1970.
Zool. Med. Leiden 70 (29), 31.xii.1996: 437-452, figs 1-13.— ISSN 0024-0672.
J. Vennam, National Institute of Oceanography, Dona Paula, Goa, 403004, India.
L.P. van Ofwegen, Nationaal Natuurhistorisch Museum, P.O. Box 9517, 2300 RA Leiden, The Netherlands.

Key words: Octocorallia; Alcyonacea; Laccadives; Indian Ocean.

Abstract: New records for the Laccadives are given and *Sinularia gravis* Tixier-Durivault, 1970, is re-examined and compared with *Sinularia gyroza* (Klunzinger, 1877) sensu Verseveldt, 1977.

Introduction

The material of the present study, comprising 11 species of Alcyonacea, was collected in February 1992 at five islands of the Laccadive Archipelago (see fig. 1 and list of species) during a cruise of the "Gaveshani", one of the research vessels of the National Institute of Oceanography, Goa, India. Most species were collected from the intertidal zone and subtidally up to a depth of 3-4 m.

The soft coral fauna of the Laccadives was previously reported upon by van Ofwegen & Vennam (1991) (19 species) and Alderslade & Shirwaiker (1991) (17 species). With the inclusion of the present report, 37 different species are known to date from the Laccadives.

The "Gaveshani" material is preserved in 70% alcohol and deposited in the National Institute of Oceanography (NIO/DOD/DIO), Dona Paula, Goa, India, and the National Natuurhistorisch Museum, formerly Rijksmuseum van Natuurlijke Historie (RMNH), Leiden, The Netherlands.

Difficulties with identification made it necessary to re-examine *Sinularia gravis* Tixier-Durivault, 1970, and *Sinularia gyroza* (Klunzinger, 1877), as described by Verseveldt (1977a: 26). This re-examination proved the two species to be conspecific.

In his revision of the genus *Sinularia* Verseveldt (1980: 9) reported that the depository of the holotype of *S. gyroza* was unknown. However, Dr Phil Alderslade of the Museum and Art Gallery of the Northern Territory, Darwin, Australia, has recently managed to locate the specimen (pers. comm.). He reports that the characters of the species are different from those attributed to it by Verseveldt, and he is currently preparing its redescription. For this reason we refer the material identified by Verseveldt as *S. gyroza* to *S. gravis*. As Verseveldt compared his *S. gyroza* material with one of the colonies identified by Tixier-Durivault as *S. gyroza*, we refer all her identifications to *S. gravis* as well. Moreover, later identifications of *S. gyroza*, based on the work of Verseveldt (1977a), are also referred to *S. gravis*.

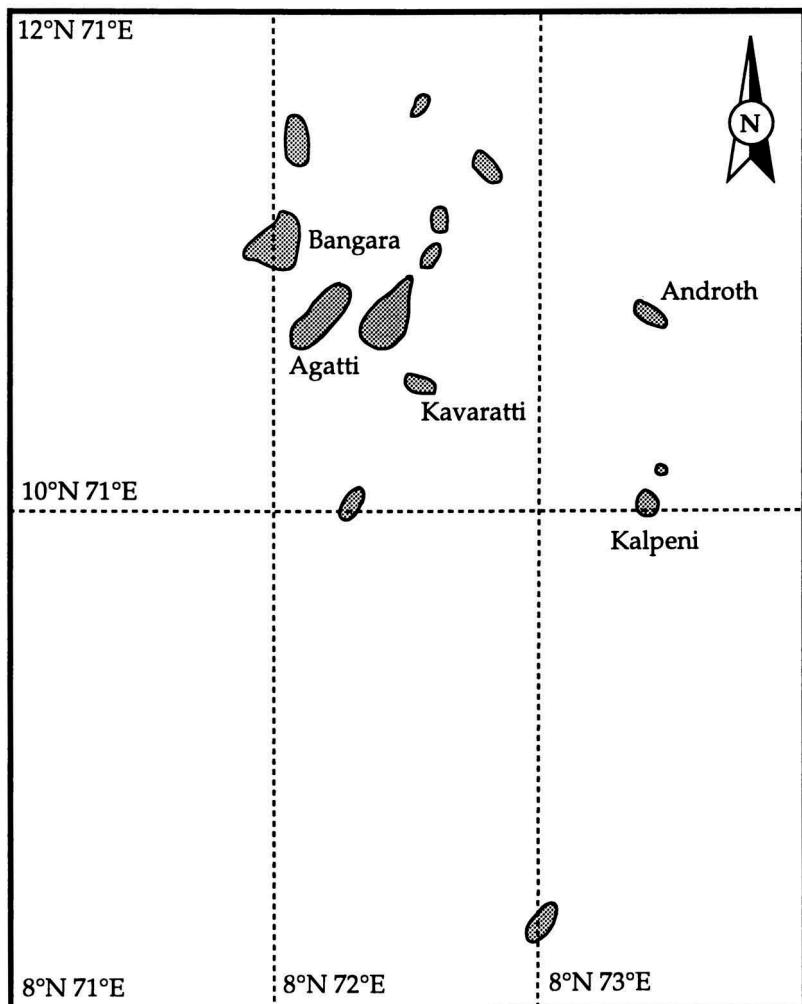


Fig. 1. Map of the Laccadive Archipelago.

List of the species

Family Alcyoniidae Lamouroux, 1812

Genus *Cladiella* Gray, 1869

C. pachyclados (Klunzinger, 1877): Agatti, Androth, Bangara, Kalpeni, Kavaratti

Genus *Lobophytum* von Marenzeller, 1886

L. crassum von Marenzeller, 1886: Agatti, Kalpeni, Kavaratti

L. pauciflorum (Ehrenberg, 1834): Agatti, Androth, Bangara, Kavaratti

Genus *Sarcophyton* Lesson, 1834

S. spinosipiculatum Alderslade & Shirwaiker, 1991: Kavaratti

S. trocheliophorum von Marenzeller, 1886: Agatti, Bangara, Kavaratti

Genus *Sinularia* May, 1898

S. abrupta Tixier-Durivault, 1970: Agatti, Androth, Kavaratti

S. dissecta Tixier-Durivault, 1945: Kavaratti

S. gravis Tixier-Durivault, 1970: Kavaratti
S. hirta (Pratt, 1903): Agatti, Kavaratti
S. leptoclados (Ehrenberg, 1834): Agatti, Kalpeni
S. muralis May, 1899: Agatti, Kavaratti

Description

Sinularia gravis Tixier-Durivault, 1970
 (figs 2-13)

Sinularia gravis Tixier-Durivault, 1970a: 249, figs 86-89; Verseveldt, 1974: 95; 1977a: 24, figs 18-19, pl. 4 fig. 1; 1980: 67, figs 30-31, pl. 14 fig. 4; van Ofwegen & Vennam, 1991: 143; Benayahu, 1995: 107.

Sinularia gyroza: Tixier-Durivault, 1945: 56; 1951: 17, figs 6, 9-12; 1953: 314; 1966: 167, figs 160-162; 1969: 148; 1970a: 248; 1970b: 177; Verseveldt, 1977a: 26, fig. 20, pl. 6 fig. 1, pl. 7 fig. 1; 1977b: 174; 1980: 9; Benayahu, 1993: 6; 1995: 107; van Ofwegen, 1996: 208.

Sinularia cf. *gyroza*; Alderslade & Shirwaiker, 1991: 189.

Not: *Alcyonium gyrosa* Klunzinger, 1877: 27, pl. 2 fig. 1 (= *Sinularia gyroza*).

? *Sinularia gyroza*; Lüttschwager, 1914: 6; Kolonko, 1926: 329; Macfadyen, 1936: 36.

Material examined.— RMNH Coel. 23806, fragment of a colony, Laccadives, Kavaratti Is., 3-5 m, ii.1992, coll. S.Y. Kamat; NIO/DOD/DIO/857, fragments of same colony.

Material studied for comparison.— RMNH Coel. 11743, Papara district, Atimaono, Tahiti, 3.i.1965; RMNH Coel. 11749 (*S. gyroza* sensu Verseveldt), Aitutake Is., Cook group, 15 m, 8.iii.1971, coll. D.M. Devaney; RMNH Coel. 11826 (*S. gyroza* sensu Verseveldt), Marotiri Is. (Bass Is.), off SE-Isle, WNW-side, 20.ii.1971, coll. D.M. Devaney; RMNH Coel. 10452, New Caledonia, 5.vii.1971, coll. A.G. Humes & R.C. Halverson; RMNH Coel. 18404, Laccadives, Kavaratti Is., 10 m, 1987.

Description of RMNH Coel. 23806.— The specimen is an encrusting fragment of

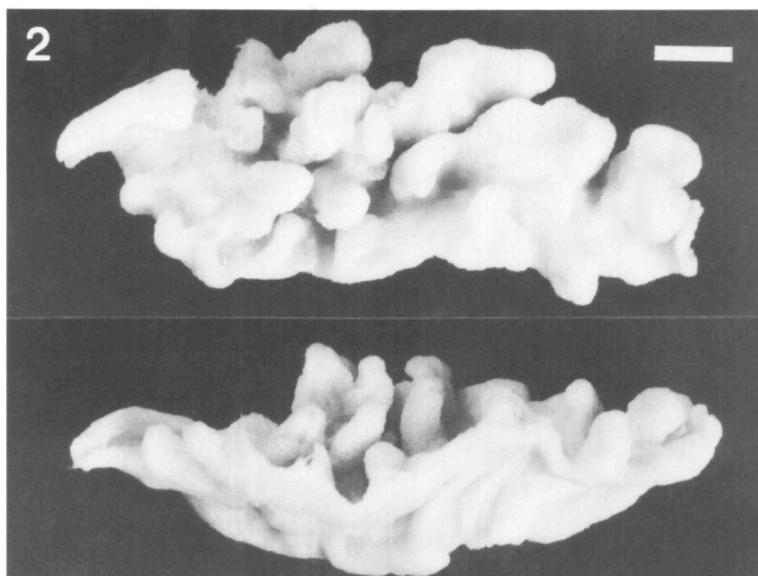


Fig. 2. *Sinularia gravis* Tixier-Durivault, 1970 (RMNH Coel. 23806); a, view from above; b, side-view. Scale 1 cm.

a colony, 3 cm high and with a maximum cross-section of 3.5×8.5 cm (fig. 2). The capitulum consists mostly of crests but some finger-like lobes are also present. The crests and lobes are about 3 mm wide and up to 1.5 cm high. All polyps are retracted into pits with about 1 mm between the centres.

Polyps with small rodlets, some of which are club-like, others have a side branch, and some crosses also occur; length 0.05-0.08 mm (fig. 4b).

Surface layer of the crests with clubs (figs 4e, 5b, 6b, 7c, 13b, d), "double clubs" (fig. 3b, 13a), and spindles (fig. 7d, 13c). The smaller clubs have a distinct central wart with a whorl of three warts below. In the larger clubs the central wart becomes indistinct. Length of the clubs 0.08-0.25 mm. The smaller spindles often with a side-branch. Length of the spindles up to 0.30 mm. Surface of the base with similar sclerites but all slightly wider (figs 9b, 10b, 11b, 12b, 13e-g). Moreover, some radiates occur, many clubs have a bifurcated handle and some capstan-like sclerites are present.

Interior of crests and lobes with spindles with spines or complex tubercles (fig. 13h). Most spindles have a median constriction, several are lozenge-shaped and some are branched. Length of the spindles up to 2.25 mm. Interior of the base with similar spindles, although more branched ones are present (fig. 13i).

Discussion

While identifying the above described specimen we noticed the close resemblance of the descriptions of *S. gravis* and *S. gyroza*, as given by Verseveldt (1977a: 24-28). Both species show encrusting colonies with crests and clubs with a central wart. The only clear difference in Verseveldt's descriptions is *S. gravis* having branched spindles in the interior of the colony, whereas *S. gyroza* has unbranched spindles. For this reason we have re-examined the material examined by Verseveldt (see "Material studied for comparison") and compared it with the present specimen. As concerns the unbranched spindles of the interior of crests and base of *S. gyroza*, we found some branched spindles in all material re-examined (fig. 5d). Anthocodial rods (fig. 4a-c), spindles of the interior, sclerites of the surface layer of the base (figs 9-12), and spindles of the surface layer of the crests (figs 7b, 7d, 8b) are similar in all specimens. However, we found differences in the shape and size of the clubs of the surface layer of the crests. In the holotype of *S. gravis* the clubs are slightly longer, the handles are wider, and the heads are less developed. Because of this difference, Verseveldt (1980) placed *S. gravis* in his group IV (length of clubs 0.12 mm and more, clubs not of *leptoclados*-type and clubs without central wart) and *S. gyroza* in group II (clubs with a central wart). The larger clubs of the present specimen and those of *S. gyroza* sensu Verseveldt are similar but the smaller clubs of the latter have a more compressed head, and the whorl of three to four warts below the central wart is less developed (fig. 4f). For the following reasons we consider the above mentioned differences as intraspecific variation:

1. Verseveldt himself (1977a) also noticed slight differences between the clubs of the type of *S. gravis* and his material from Tahiti (RMNH Coel. 11743), nevertheless he considered them conspecific.

2. Difference in size of clubs has been reported by Ofwegen & Vennam (1994: 138, fig. 3) for *S. capitalis* (Quoy & Gaimard, 1833). In that case the difference was 0.10 mm, much more than in *S. gravis*.

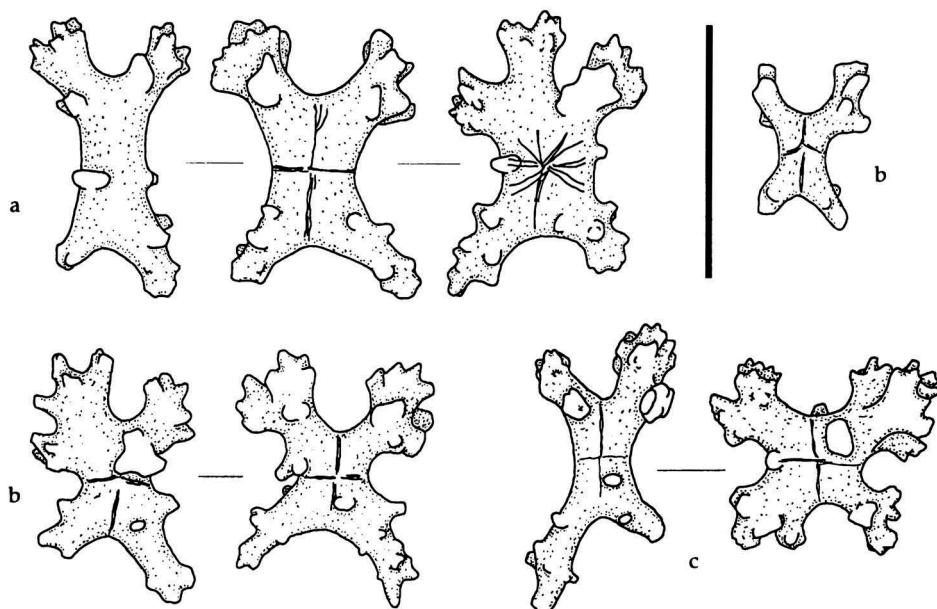


Fig. 3. *Sinularia gravis* Tixier-Durivault, 1970; a-c, double clubs of surface layer of crests; a, holotype; b, RMNH Coel. 23806; c, RMNH Coel. 11749 (*S. gyroza* sensu Verseveldt). Scale 0.10 mm.

3. The striking resemblance in colony form between the type of *S. gravis* (Verseveldt, 1980: pl. 14 fig. 4) and the colony of *S. gyroza* from Marotiri island (Verseveldt, 1977a: pl. 6 fig. 1.). Both colonies showing rounded, sinuous crests. (In the present specimen (fig. 2), the colony of *S. gravis* from Tahiti (Verseveldt, 1977a: pl. 4 fig. 1), and the colony of *S. gyroza* from Aitutake island (Verseveldt, 1977a: pl. 7, fig. 1) the sinuous crests are less developed).

It remains puzzling why Verseveldt never mentioned that many clubs of *S. gravis* have a central wart, whereas he depicted so many of these.

Acknowledgements

We wish to thank M. van Engelen (Nationaal Natuurhistorisch Museum) for making photographs of the specimen.

References

Alderslade, P. & P. Shirwaiker, 1991. New species of soft corals (Coelenterata: Octocorallia) from the Laccadive Archipelago. *The Beagle* 1991 8 (1): 189-233: figs 1-48.
 Benayahu, Y., 1993. Corals of the South-west Indian Ocean. I. Alcyonacea from Sodwana Bay, South Africa.— *Invest. Rep. Oceanogr. Res. Inst.* 67: 1-16, figs 1-7.
 Benayahu, Y., 1995. Species composition of soft corals (Octocorallia, Alcyonacea) on the coral reefs of Sesoko island, Ryukyu Archipelao, Japan.— *Galaxea* 12: 103-124, figs 1-10, pl. 1 (A-I).
 Klunzinger, C.B., 1877. *Die Korallthiere des Rothen Meeres. I. Die Alcyonarien und Malacodermen: i-iv + 1-98, pls 1-8.*— Berlin.

Kolonko, K., 1926. Beiträge zu einer revision der Alcyonarien. Die Gattung *Sinularia*.— Mitt. zool. Mus. Berlin 12 (2): 291-334, pls 1-4.

Lüttschwager, J., 1914. Beiträge zu einer Revision der Familie Alcyoniidae.— Arch. Naturgesch. (A) 80 (10): 1-42, figs 1-9.

Macfadyen, L.M.I., 1936. Alcyonaria (Stolonifera, Alcyonacea, Telestacea and Gorgonacea).— Great Barrier Reef Exped. 1928-29, Sci. Rep., 5 (2): 19-71, figs 1-11, pls 1-5.

Ofwegen, L.P. van, 1996. Octocorallia from the Bismarck Sea (part II).— Zool. Med. Leiden 70: 207-215, figs 1-5.

Ofwegen, L.P. van & J. Vennam, 1991. Notes on Octocorallia from the laccadives (SW India).— Zool. Med. Leiden 65: 143-154, figs 1-7.

Ofwegen, L.P. van & J. Vennam, 1994. Results of the Rumphius Biohistorical Expedition to Ambon (1990). Part 3. The Alcyoniidae (Octocorallia: Alcyonacea).— Zool. Med. Leiden 68: 135-158, figs 1-20.

Tixier-Durivault, A., 1945. Les Alcyonaires du Muséum. I. Famille des Alcyoniidae. 2. Genre *Sinularia*.— Bull. Mus. nat. Hist. nat. Paris (2) 17 (1): 55-63.

Tixier-Durivault, A., 1951. Révision de la famille des Alcyoniidae. Le genre *Sinularia* May, 1898.— Mém. Inst. roy. Sci. nat. Belgique (2) 40: 1-146, figs 1-194.

Tixier-Durivault, A., 1953. Sur quelques Alcyoniidés de Tahiti et des îles Fidji.— Bull. Mus. nat. Hist. nat. Paris (2) 25 (3): 311-319, 1 fig.

Tixier-Durivault, A., 1966. Octocoralliaires de Madagascar et des îles avoisinantes.— Faune de Madagascar 21: 1-456, figs 1-399.

Tixier-Durivault, A., 1969. Les Alcyoniidae des Tuamotu (Mururoa) et des Gambier.— Cahiers du Pacifique 13: 133-157, figs 1-9.

Tixier-Durivault, A., 1970a. Les octocoralliaires de Nouvelle-Calédonie.— L'Expédition française sur les récifs coralliens de la Nouvelle-Calédonie organisée sous l'égide de la fondation Singer-Polignac 1960-1963, 4: 171-350, figs 1-173.

Tixier-Durivault, A., 1970b. Les octocoralliaires de Nha-Trang (Viet-Nam).— Cahiers du Pacifique 14: 115-236, figs 1-74.

Verseveldt, J., 1974. Octocorallia from New Caledonia.— Zool. Med. Leiden 48: 95-112, figs 1-17, pls 1-5.

Verseveldt, J., 1977a. Octocorallia from various localities in the Pacific Ocean.— Zool. Verh. Leiden 150: 1-42, figs 1-28, pls 1-10.

Verseveldt, J., 1977b. Australian Octocorallia (Coelenterata).— Aust. J. mar. Freshwater Res. 28: 171-240, figs 1-49.

Verseveldt, J., 1980. A revision of the genus *Sinularia* May (Octocorallia, Alcyonacea).— Zool. Verh. Leiden 179: 1-128, figs 1-68, pls 1-38.

Received: 1.x.1996

Accepted: 17.x.1996

Edited: J.C. den Hartog

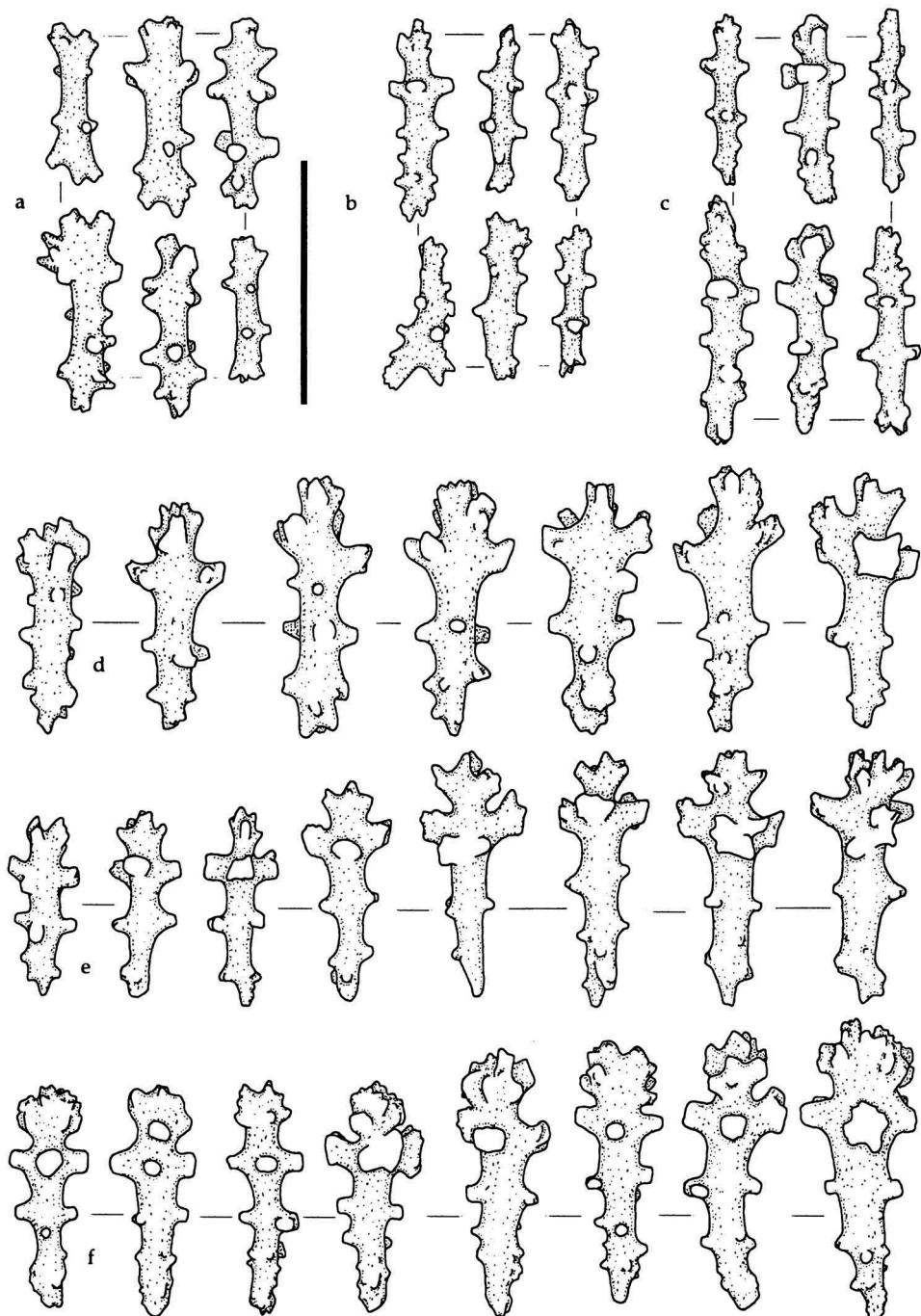


Fig. 4. *Sinularia gravis* Tixier-Durivault, 1970; a-c, rods of polyps; d-f, clubs of surface layer of crests; a, d, holotype; b, e, RMNH Coel. 23806; c, f, RMNH Coel. 11749 (*S. gyroa* sensu Verseveldt). Scale 0.10 mm.

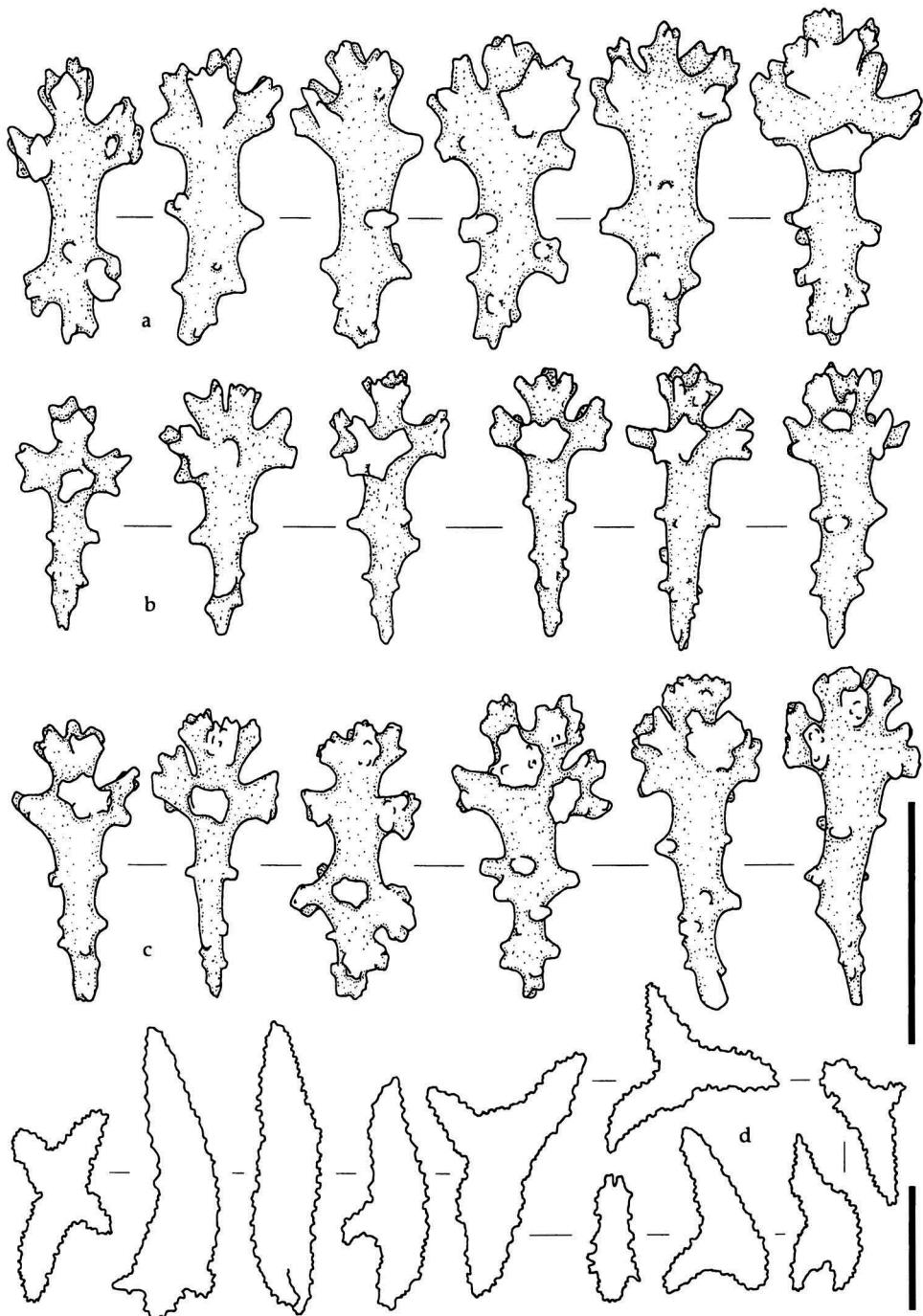


Fig. 5. *Sinularia gravis* Tixier-Durivault, 1970; a-c, clubs of surface layer of crests; a, holotype; b, RMNH Coel. 23806; c, RMNH Coel. 11749; d, spindles (outline) of interior of crests of RMNH Coel. 11749 (*S. gyroza* sensu Verseveldt). Scale at c 0.10 mm also applies to a,b. Scale at d 0.50 mm.

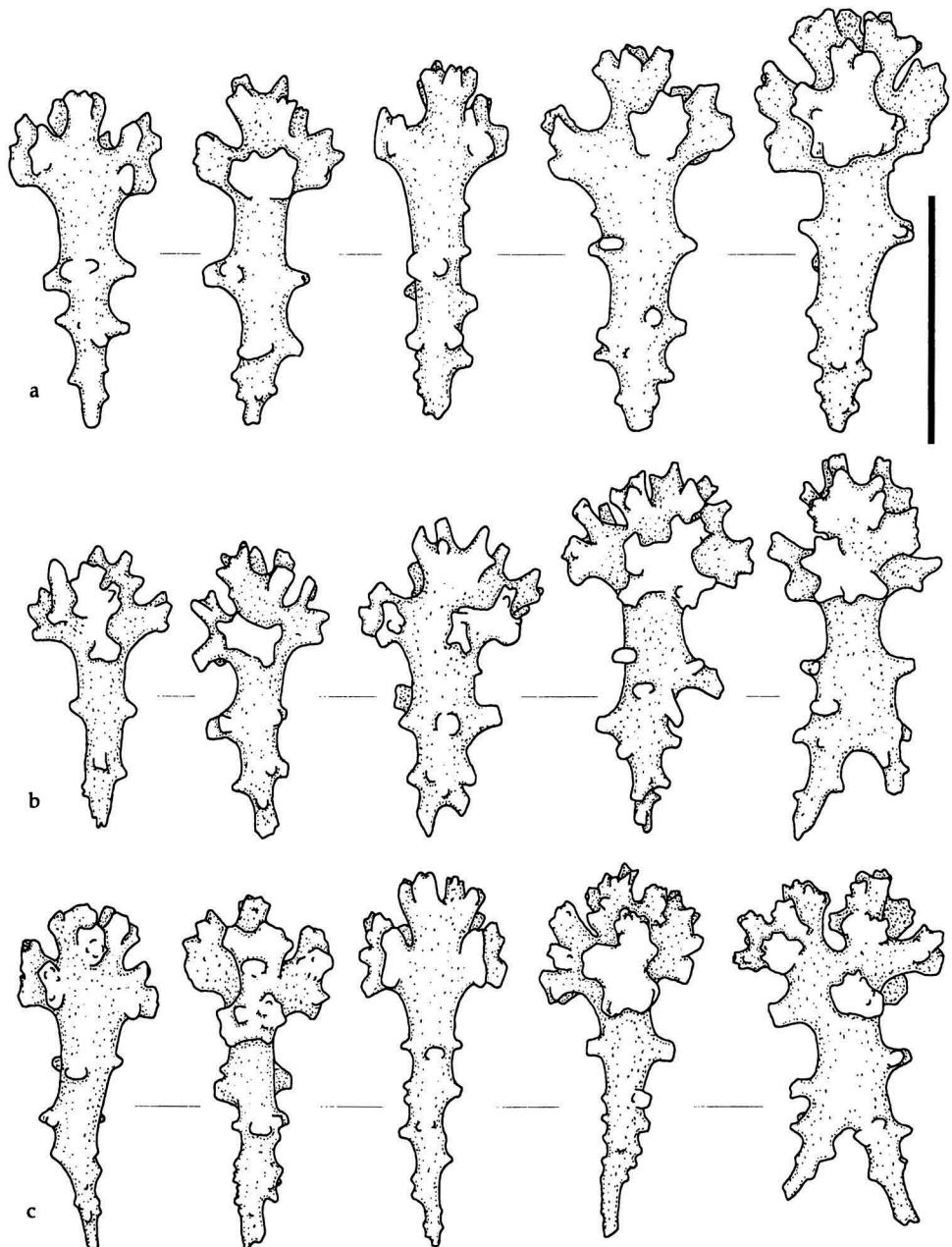


Fig. 6. *Sinularia gravis* Tixier-Durivault, 1970; a-c, clubs of surface layer of crests; a, holotype; b, RMNH Coel. 23806; c, RMNH Coel. 11749 (*S. gyroza* sensu Verseveldt). Scale 0.10 mm.

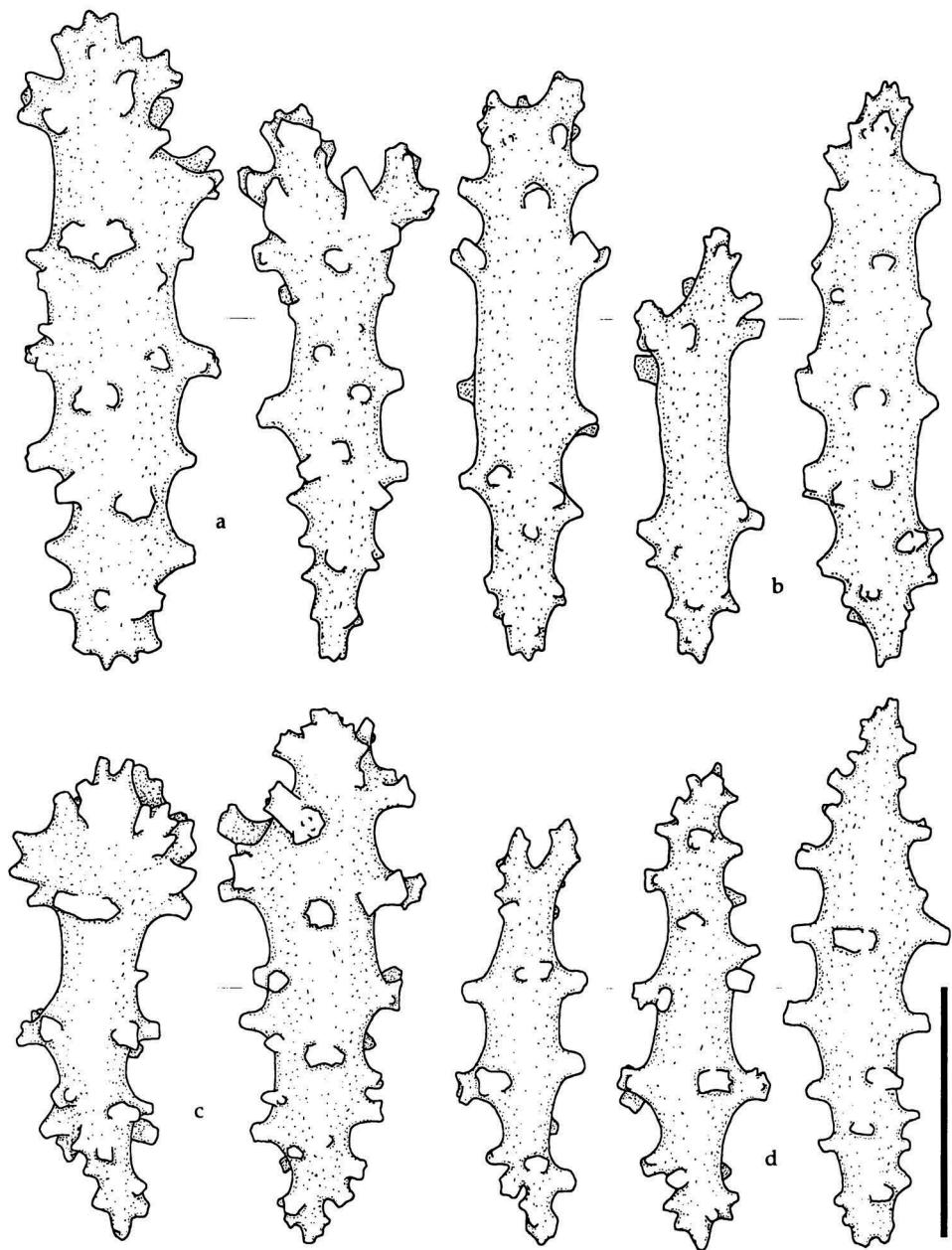


Fig. 7. *Sinularia gravis* Tixier-Durivault, 1970; a, c, clubs of surface layer of crests; b, d, spindles of surface layer of crests; a, b, holotype; c, d, RMNH Coel. 23806. Scale 0.10 mm.

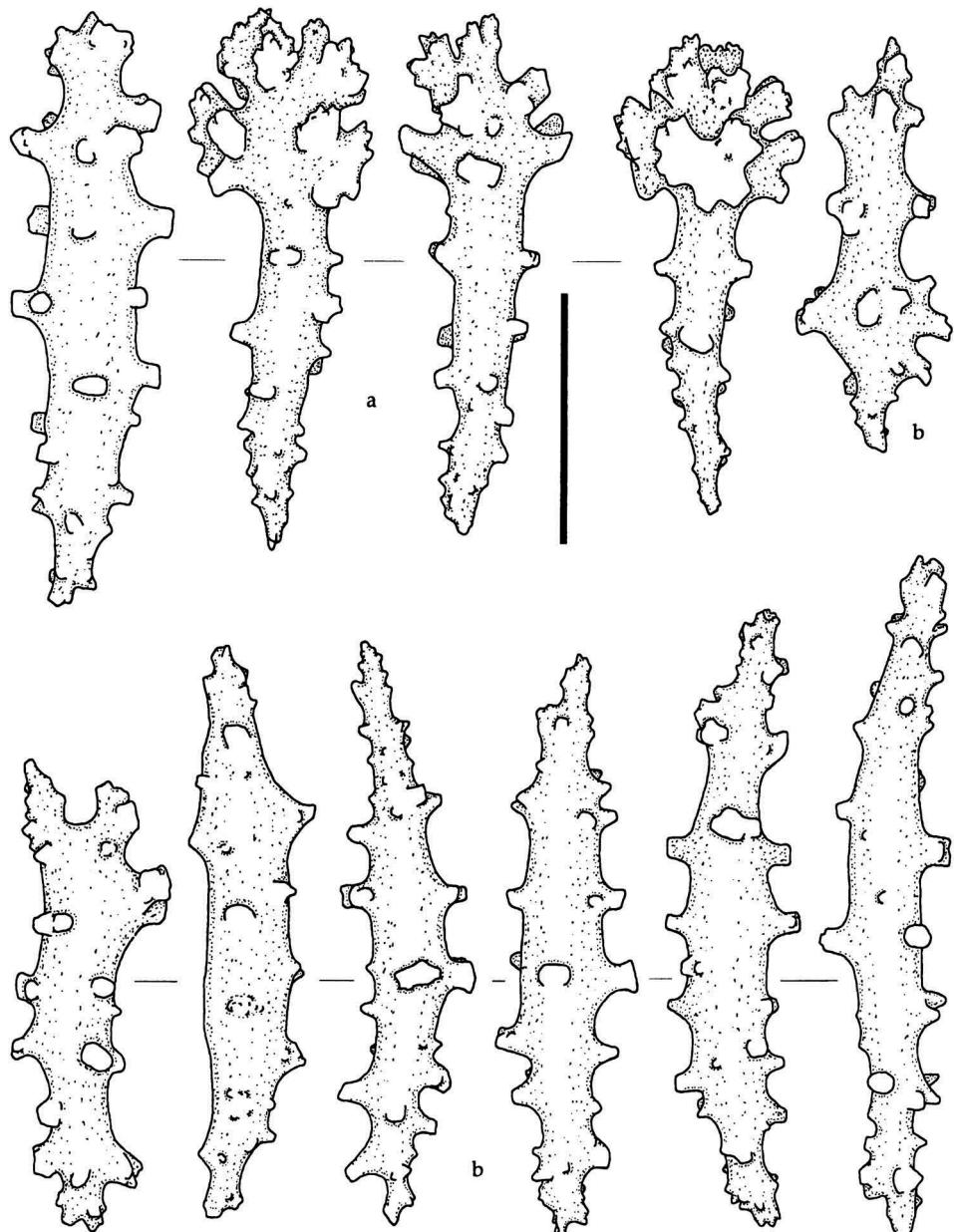


Fig. 8. *Sinularia gravis* Tixier-Durivault, 1970 (RMNH Coel. 11749, *S. gyrosa* sensu Verseveldt); a, clubs of surface layer of crests; b, spindles of surface layer of crests. Scale 0.10 mm.

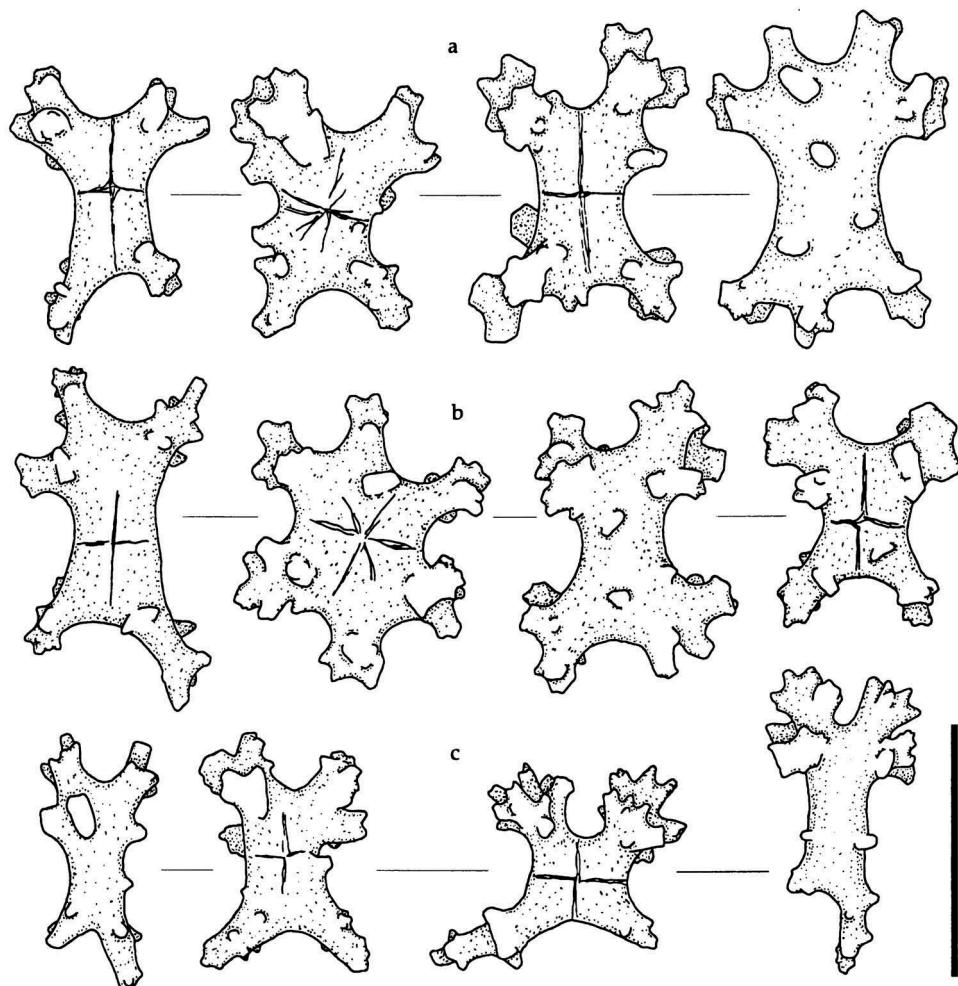


Fig. 9. *Simularia gravis* Tixier-Durivault, 1970; a-c, double clubs of surface layer of base; a, holotype; b, RMNH Coel. 23806; c, RMNH Coel. 11749 (*S. gyroza* sensu Verseveldt). Scale 0.10 mm.

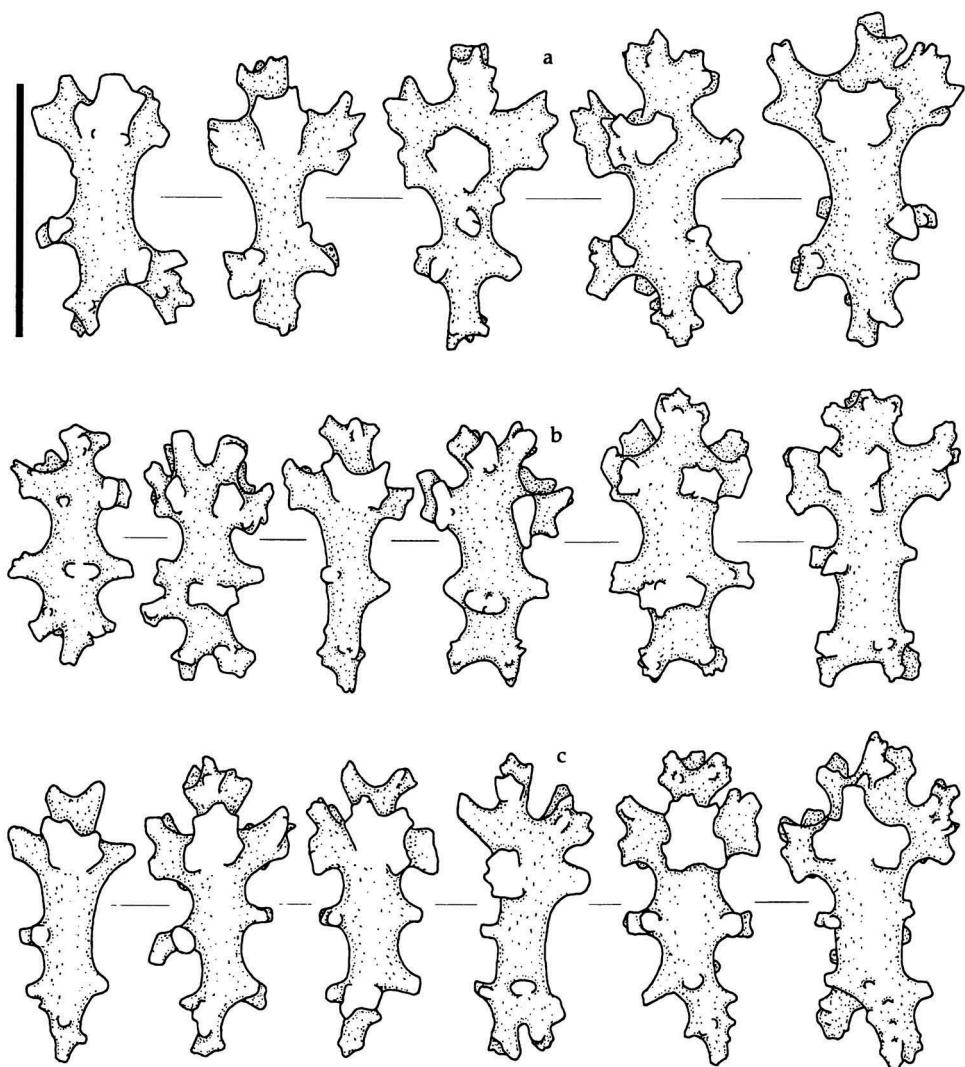


Fig. 10. *Sinularia gravis* Tixier-Durivault, 1970; a-c, clubs of surface layer of base; a, holotype; b, RMNH Coel. 23806; c, RMNH Coel. 11749 (*S. gyrosa* sensu Versteveldt). Scale 0.10 mm.

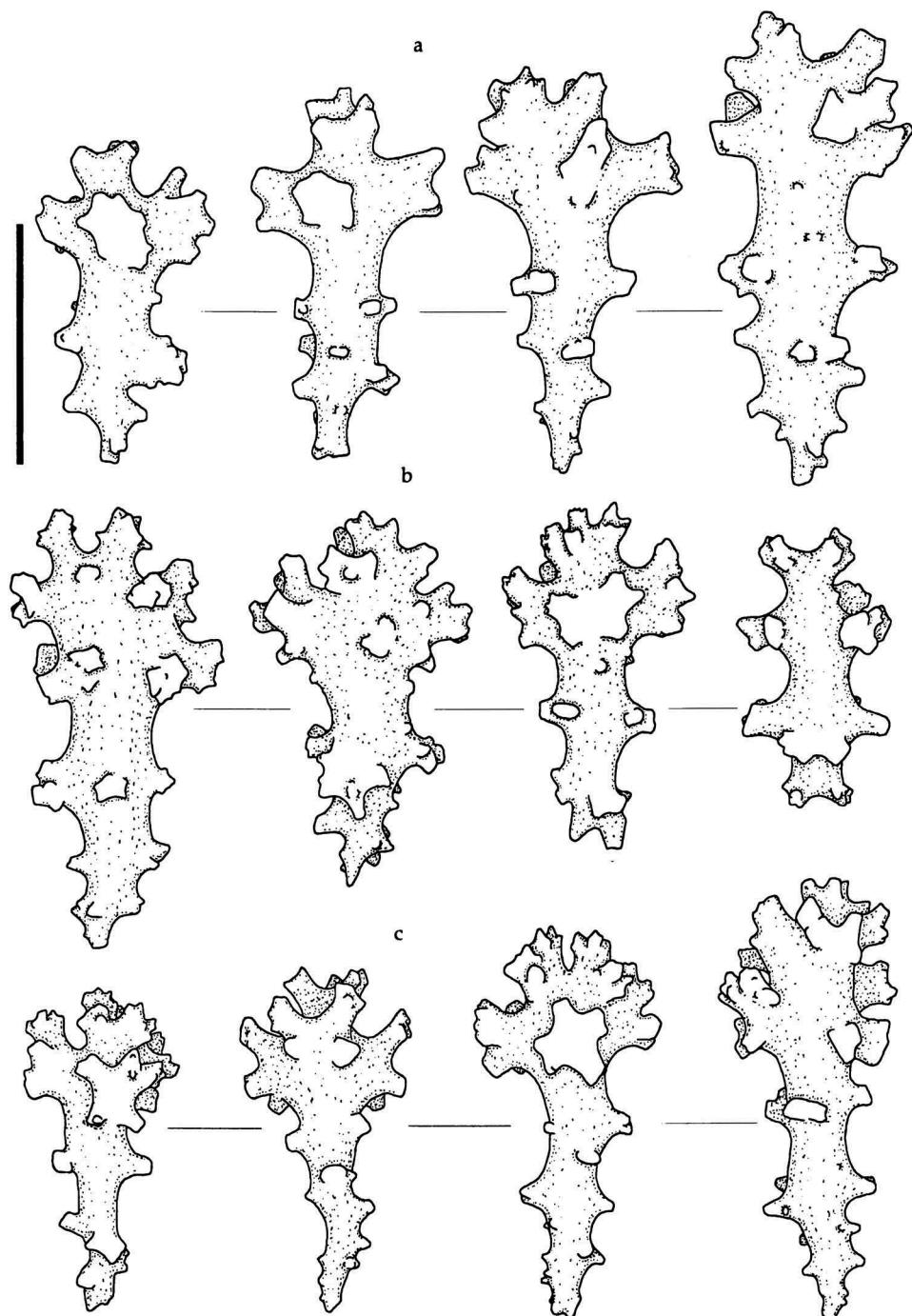


Fig. 11. *Sinularia gravis* Tixier-Durivault, 1970; a-c, clubs of surface layer of base; a, holotype; b, RMNH Coel. 23806; c, RMNH Coel. 11749 (*S. gyroza* sensu Verseveldt). Scale 0.10 mm.

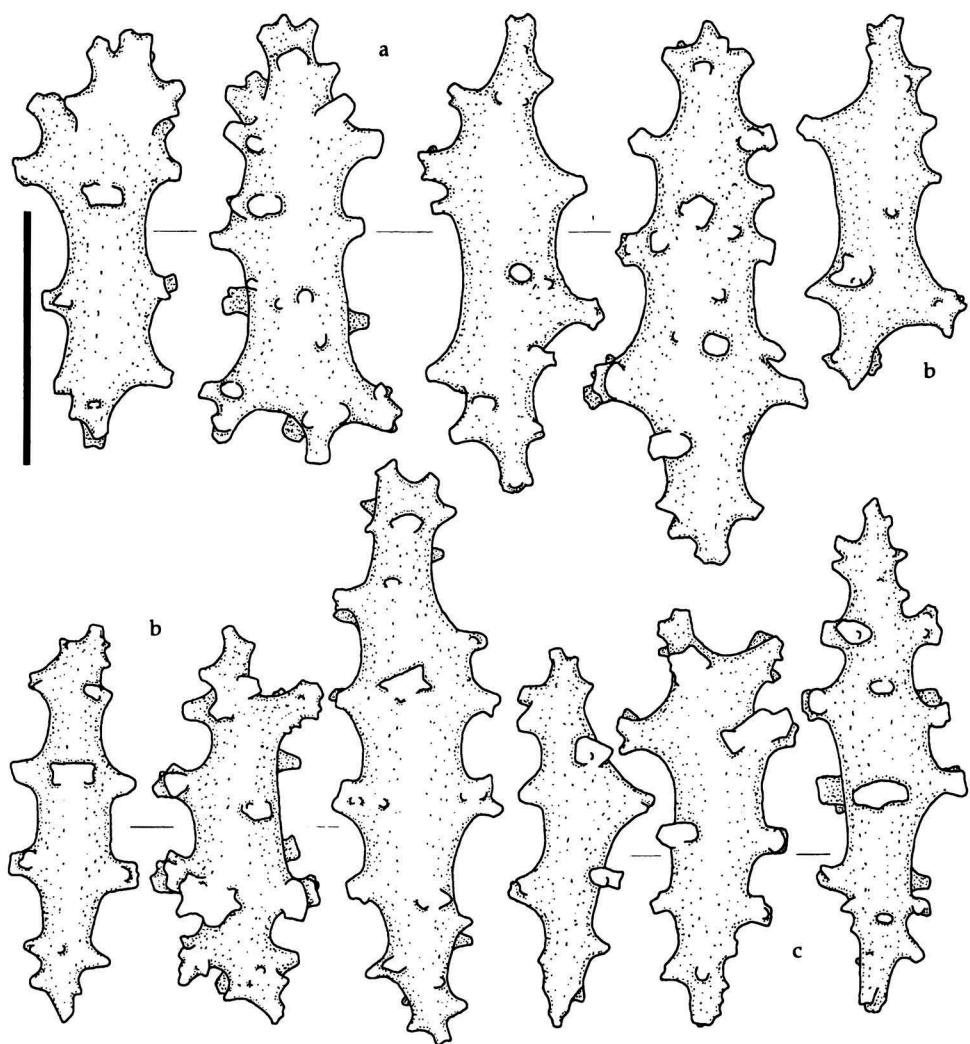


Fig. 12. *Sinularia gravis* Tixier-Durivault, 1970; a-c, spindles of surface layer of base; a, holotype; b, RMNH Coel. 23806; c, RMNH Coel. 11749 (*S. gyroza* sensu Verseveldt). Scale 0.10 mm.

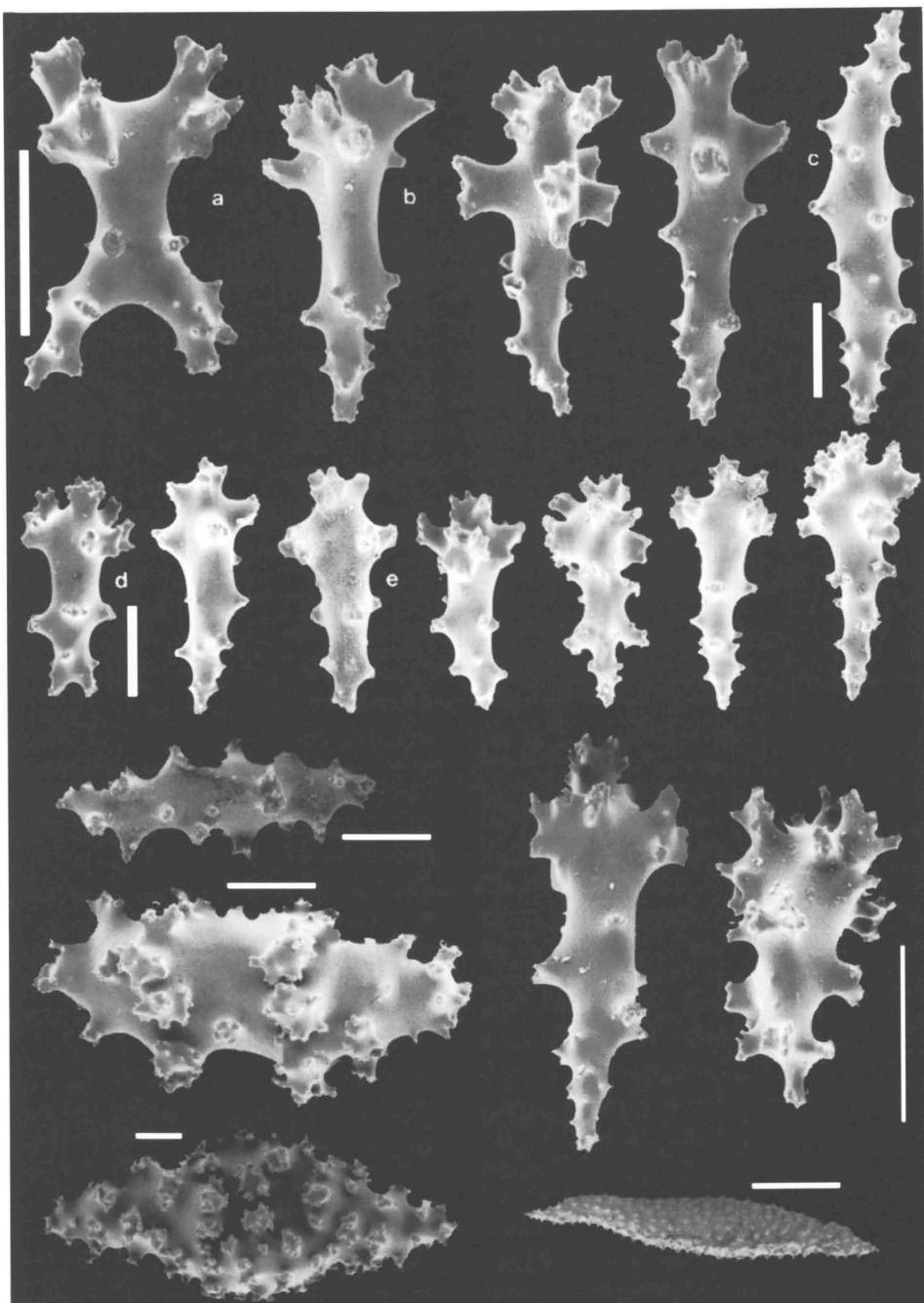


Fig. 13. *Sinularia gravis* Tixier-Durivault, 1970 (RMNH Coel. 23806); a-d, sclerites of surface layer of crests; e-g, sclerites of surface layer of base; a, double club; b, clubs; c, spindle; d, clubs; e, clubs; f, spindle; g, clubs; h, spindle of interior of crests; i, spindles of interior of base. Scales 0.05 mm and 0.50 mm (spindle in lower right corner).